

REMARKS

The specification has been amended to correct grammatical and idiomatic errors, and to overcome the rejection under 35 USC §101 by deleting references to current of “opposite polarity.”

The Examiner is correct that the current supplied by the secondary winding or inductor during zero current periods of the power supply has the same “polarity” with respect to the load as does current output by the power supply during non-zero periods. The original reference to “opposite polarity” was apparently intended to refer to the cyclical charging and discharging of the secondary winding or inductor itself, but it is agreed that the phrase “opposite polarity” was confusing in the context of the invention. The phrase has therefore been deleted.

Even though the phrase “opposite polarity” has been deleted, it is respectfully submitted that no new matter is involved. Deletion of the phrase opposite polarity merely corrects an awkward description of the operation of the depicted circuits, and does not change the disclosure of the circuits. To the contrary, it is respectfully submitted that those skilled in the art would have understood the phrase “opposite polarity” to be misleading, and would have correctly interpreted the original specification in the same manner as the Examiner. The corrections to the specification merely conform the specification to the Examiner’s correct understanding of the invention.

Having thus overcome the rejection under 35 USC §101, early and favorable action on the merits is requested.

Serial Number 09/940,898

Respectfully submitted,

BACON & THOMAS, PLLC

A handwritten signature in black ink, appearing to read 'B. Urcia', with a long horizontal line extending to the right.

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ORIGINAL SPECIFICATION

Ser. No. 09/940,898

Examiner G. Toatley

Group Art Unit 2836

**TITLE: CIRCUIT FOR THE GENERATION OF ELECTRIC POWER
INDUCED TO BEAR OF OPPOSITE POLARITY IN THE A
PULSATING POWER SUPPLY**

RECEIVED

5

BACKGROUND OF THE INVENTION

MAR 12 2004

(a) Field of the Invention

~~Circuit A circuit for the Generation of Electric Power induced to bear generating~~
~~electric power of opposite polarity in the Pulsating Power Supply a pulsating power~~
10 ~~supply, whereby electric power of opposite polarity is generated at the moment the D.C.~~
~~pulsating power that is being delivered is suspended, by means of makes use of an~~
~~induction device in series or in parallel with the load, or alternatively by means of an LC~~
~~parallel circuit which is in series or in parallel with the load, and the power of opposite~~
~~polarity thus generated is being fed to the load, highlighted in to provide a substantial cut~~
15 ~~in production cost costs with enhanced operational reliabilities reliability.~~

(b) Description of the Prior Art

In conventional arts, ~~device of circuits for the generation of electric power of~~
~~opposite polarity to make up for sudden interruption interruptions of a master D.C.~~
~~pulsating power supply is prosecuted are carried out by cyclical exchange of polarities,~~
20 ~~and that which involves a much too complicated circuitry design associated with high~~
~~costs.~~

SUMMARY OF THE INVENTION

25 ~~Circuit A circuit for the Generation of Electric Power induced to bear generating~~
~~electric power of opposite polarity in the Pulsating Power Supply, whereby electric power~~
~~of opposite polarity is generated a pulsating power supply, at the moment the D. C.~~
~~pulsating power that is being delivered is suspended, by means of utilizes an induction~~

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device in series or in parallel with the load, or alternatively ~~by means of an LC parallel circuit which is in series or in parallel with the load, and the so that~~ power of opposite polarity thus generated is fed to the load, highlighted in. As a result, there is a substantial cut in production ~~cost costs~~ with enhanced operational ~~reliabilities~~ reliability.

5

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 ~~is an illustration of the invention~~ a schematic illustration of electric power generating circuitry with constructed in accordance with the principles of the invention,
10 in which the primary coil of the transformer is in series with the D.C. pulsating power supply;

Fig. 2 ~~is an illustration of the invention~~ a schematic illustration of electric power generating circuitry with according to the invention, in which the primary coil of the transformer is in parallel with the D.C. pulsating power supply;

15 Fig. 3 ~~is an a schematic illustration of the invention circuitry using in the configuration an embodiment that includes~~ parallel inductive elements;

Fig. 4 ~~is an a schematic illustration of the embodiment represented in Fig. 3 with the an embodiment that includes~~ inductive elements ~~further made in parallel with~~ capacitive elements;

20 Fig. 5 ~~illustrates the invention circuitry using in the configuration is a schematic illustration of an embodiment that includes~~ serially connected inductors; and,

Fig. 6 ~~illustrates the invention circuitry featuring the series connection of an is a schematic illustration of an embodiment that includes an~~ LC parallel loop comprising inductive and capacitive elements.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The invention provides a circuit for the generation of electric power ~~induced to bear of opposite polarity in the a~~ pulsating power supply, whereby electric power of opposite

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polarity is generated the moment ~~the delivery of~~ D.C. pulsating power ~~that is being delivered~~ is interrupted, by means of an induction device in series or in parallel with the load, or alternatively by means of an LC parallel circuit which is in series or in parallel with the load, ~~and the power of opposite polarity thus generated is being fed to the load,~~
5 ~~highlighted in resulting in a substantial cut in production costs in parallel together with~~
~~enhanced operational reliabilities~~ reliability.

Referring to Fig. 1, ~~an illustration shows an~~ of the invention ~~whereof in which~~ the primary coil of the transformer is in series with the D.C. pulsating power supply, the essential components ~~in this execution consist of~~ which include:

- 10 - a D.C. pulsating power supply PPS101; yielding for providing pulsating D.C. currents ~~from through~~ rectification of an A. C. source or D. C. source ~~gone through with~~ linear control or switching control;
- 15 - ~~Transformer~~ a transformer T101; in the form of a cored or coreless transformer comprising coil windings or stacked coils which account for a primary winding WP and ~~for a~~ secondary winding WS respectively; with the primary winding WP made connected in series with the power supply, and the secondary winding WS ~~made optionally connected~~ in series with a Current Limiting Resistor current limiting resistor R101; for ~~paralleling parallel connection~~ across both terminals of the power supply having been made in series with a primary winding WP, the
- 20 ~~power supply being of a pulsating D.C. mode PPS101;~~ or, as pursuant to a ~~variant execution the variation~~ illustrated in Fig. 2, ~~whereof with~~ the secondary coil WS of the transformer is being firstly made connected in parallel with the pulsating D.C. power supply PPS101, followed by ~~allowing for~~ serial connection of ~~a the~~ primary coil WP, bound for between the power supply and the load; it is
- 25 ~~to be being~~ noted that the polarity correlation between the primary coil WP and the secondary coil WS of ~~said the~~ transformer T101 is such that a reduction or cutoff of the causal D.C. power will bring about power of ~~the opposite polarity~~ on the load side;

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- 5 - ~~Load a load LD101~~ in the form of a rechargeable secondary cell, electroplating bath, or ~~electrolytical-electrolytic~~ processing electrode together with working objects, or ~~still those~~ any other load necessitating the input of power of the opposite polarity in the event of power interruption or of a reduction in power supply ~~which is necessarily pulsating D.C. power supply~~;
- 10 - ~~Conduction Contacts or Plug/Socket Assembly~~ conduction contacts or a plug/socket assembly P0; ~~being as such composed from~~ made up of electromechanical components; and ~~being optional~~ optionally, ~~with having one~~ terminal connected to the charging power supply and relevant circuits on the power supply side, and the other terminal connected for coupling ~~purpose going~~ purposes to the load side;
- 15 - ~~Blocking Diode~~ optional a blocking diode CR101; ~~being in the form of a~~ structurally solid state diode in forward series connection with the input port of the power supply to prevent power of the opposite polarity, once generated, from ~~running flowing~~ back to the power supply, ~~being optional in the configuration for execution.~~

The following is a description of the operation ~~rational~~ of the circuits represented in both Fig. 1 and Fig. 2.

20 When power is ~~being simultaneously~~ delivered way from the power supply PPS101, ~~which is a D.C. power supply~~, to the load and to the primary winding WP of the transformer T101, for excitation to a steadily resistive state ~~at the same time~~, both the secondary winding WS of the transformer T101 and the optionally provided current limiting resistor R101 will ~~be induced with~~ have normal, magnetizing currents induced therein;

25 Once power due to the pulsating D.C. power supply ~~turns down is reduced~~ or gets cut off, power of the opposite polarity will be generated in the secondary winding WS of the transformer T101, to be delivered ~~eventually~~ to the load.

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In the ~~illustration of the invention executed in~~ embodiment having a parallel inductance circuit, as represented in Fig. 3, the main components include:

- ~~Pulsating~~ pulsating D.C. power supply PPS101: generated in a controlled state by linear or switching elements, from a rectified A.C. or D.C. power supply;
- 5 - ~~Inductance~~ inductance L101: in the form of cored or coreless inductors wound in ~~coil~~ coiled or stacked ~~to~~ formation, for parallel connection across both terminals of the power supply, ~~to be~~ and optionally connected in series with a current limiting resistor R101;
- ~~Load~~ load LD101: in the form of a rechargeable secondary cell, ~~or~~ electroplating bath, or ~~electrolytical~~ electrolytic processing electrode together with working objects, or ~~still these~~ any other load necessitating the input of power of the opposite polarity in the event of power interruption or of a reduction in power supply which is necessarily pulsating D.C. power supply;
- 10 - ~~Conduction Contacts or Plug/Socket Assembly~~ conduction contacts of plug/socket assembly P0: ~~being as such composed from of~~ electromechanical components, and, ~~being optional~~ optionally, with having one terminal connected to the charging power supply and relevant circuits on the power supply side, and the other terminal connected for coupling ~~purpose going purposes~~ to the load side;
- 15 - ~~Blocking Diode~~ optional blocking diode CR101: ~~being structurally in the form of~~ a solid state diode in forward series connection with the input port of the power supply to prevent power of the opposite polarity ~~once generated from~~ running back to the power supply, ~~being optional in the configuration for execution.~~
- 20

The operation ~~rational~~ of the circuit illustrated in Fig. 3 is described below:

- 25 When power due to the pulsating D.C. power supply PPS101 is available for output, it will go straight as input to the load as well as exciting the inductor L101 ~~til~~ until the latter is driven to a steadily resistive state; and in the meantime generate normal, magnetizing current ~~passing optionally that optionally passes through~~ the current limiting

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resistor R101;

Once the pulsating D.C. power supply voltage ~~turns~~ is turned down or becomes cut off, power of the opposite polarity will be induced in the inductor L101, and ~~that~~ delivered to the load LD101.

5 The circuit represented in Fig. 4 is an adaptation of the circuit shown in Fig. 3 ~~by the incorporation of that~~ adds a parallel capacitor to the ~~existent~~ existing inductor, ~~structurally comprising including:~~

- 10 - ~~Pulsating~~ pulsating D.C. Power Supply PPS101: ~~generated~~ arranged to generate pulses in a controlled state by linear or switching elements from rectified A.C. or D.C. power source;
- ~~Inductance~~ inductance L101: in the form of cored or coreless inductors wound in ~~coil~~ coiled or stacked ~~to~~ formation, for parallel connection across both terminals of the power supply, ~~to be~~ and optionally in series with a current limiting resistor R101;
- 15 - ~~Capacitor~~ A capacitor C101: connected in parallel with the inductor L101 to interact with the inductor L101 and ~~to respond resistively in accord~~ accordance with the frequency of the pulsating D.C. power supply;
- Load LD101: in the form of a rechargeable secondary cell, ~~or~~ electroplating bath, or ~~electrolytical~~ electrolytic processing electrode together with working objects,
- 20 or ~~still these~~ any load necessitating the input of power of the opposite polarity in the event of power interruption or of a reduction in the power supply ~~which is necessarily pulsating D.C. power supply;~~
- ~~Conduction Contacts or Plug/Socket Assembly~~ conduction contacts or plug/socket assembly P0: ~~being as such composed from of~~ electromechanical
- 25 components; and ~~being, optional~~ optionally, with having one terminal connected to the charging power supply and relevant circuits on the power supply side, and the other terminal connected for coupling ~~purpose going purposes~~ to the load side;

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~~- Blocking Diode optional blocking diode CR101: being structurally in the form of~~
a solid state diode in forward series connection with the input port of the power
supply to prevent power of the opposite polarity once generated from running
back to the power supply, ~~being optional in the configuration for execution.~~

5 What follows is a description of the operation rationale of the circuit illustrated in
Fig. 4;

When the power supply PPS101 is available for output, D.C. current will be
delivered straight to the load and to excite the LC parallel loop comprising inductor L101
and capacitor C101 until it turns steadily resistive, and ~~that run through with~~ carries a
10 normal magnetizing current, as does an optionally provided current limiting resistor
R101;

Once the incoming pulsating D.C. power supply turns down or becomes cut off,
power of the opposite polarity will be generated in the LC parallel loop which consists of
inductor L101 and capacitor C101 for output to the load LD101.

15 In the circuit comprising a serially connected inductor that is shown in Fig. 5, the
essential components are ~~described below:~~

- ~~Pulsating pulsating~~ D.C. power supply PPS101: generated arranged to generate
pulses in a controlled state by linear or switching elements, from rectified A.C. or
from a D.C. power supply;
- 20 - ~~Inductor inductor~~ L101: in the form of cored or coreless inductors wound in coil
coiled or stacked to formation, for serial connection ~~way~~ between the output
terminal of the power supply and the load LD101;
- ~~Backflow Resistor backflow resistor~~ R500: composed of resistive elements,
paralleled and parallel connected across the positive terminal of the pulsating
25 D.C. power supply PPS101, which is in connection with the inductor L101, and
the negative terminal of the same pulsating D.C. power supply PPS101, to allow
for passage of ~~the~~ power of opposite polarity;
- ~~Blocking Diode optional blocking diode CR101: being in the form of a solid state~~

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diode in forward series with the input port of the power supply to prevent power of the opposite polarity once generated from running back to the power supply; ~~being optional in the configuration for execution;~~

5 - ~~Load-load~~ LD101: in the form of a rechargeable secondary cell, ~~or electroplating bath, or electrolytical-electrolytic processing electrode together with working objects, or still these~~ any other load necessitating the input of power of the opposite polarity in the event of power interruption or of a reduction in the power supply ~~which is necessarily pulsating D.C. power supply;~~

10 - ~~Conduction Contacts or Plug/Socket Assembly~~ conduction contacts or plug-socket assembly P0: ~~being as such composed from of~~ electromechanical components; and, ~~being optional~~ optionally, ~~with~~having one terminal connected to the charging power supply and relevant circuit on the power supply side, and the other terminal connected for coupling ~~purpose going purposes~~ to the load side.

15 What follows next is a description of the operation of the circuit represented in Fig.

5;

When there is power available for output from the power supply PPS101, D.C. current will pass to the load by way of the inductor L101 in serial connection;

20 Should the power supply PPS101 voltage ~~turn down or turn be reduced or turned~~ off, power of the opposite polarity will be produced ~~about in~~ the inductor L101 and delivered eventually to the load via backflow resistor R500.

In the circuit represented in Fig. 6, an LC circuit in parallel comprising inductive and capacitive elements in series ~~with the invention configuration~~, the essential components employed ~~include~~ including:

25 - ~~Pulsating pulsating~~ D. C. power supply PPS101: ~~generated~~ arranged to generate in a controlled state by linear or switching elements from a rectified A.C. or ~~from~~ D.C. source;

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- ~~Inductor-inductor~~ L101: in the form of cored or coreless inductors wound in ~~coil~~
~~coiled or stacked to~~ formation, for serial connection ~~way~~ between the output
terminal of the power supply and the load LD101;
- 5 - ~~Capacitor-capacitor~~ C101: in parallel with the inductor L101 to interact with the
inductor L101 and to respond resistively in ~~accord~~ accordance with the frequency
of the pulsating D.C. Power Supply;
- ~~Backflow Resistor-backflow resistor~~ R500: composed of resistive elements;
~~paralleled and connected in parallel~~ across the positive terminal of the pulsating
D.C. power supply PPS101, which is ~~in connection with~~ connected to the
10 inductor L101, and the negative terminal of the same pulsating D.C. power supply
PPS101, to allow for passage of the power of opposite polarity;
- ~~Blocking Diode-optional blocking diode~~ CR101: ~~being~~ in the form of a solid state
diode in forward series with the input port of the power supply to prevent power
of the opposite polarity once generated from running back to the power supply;
15 ~~being optional in the configuration for execution~~;
- ~~Load-load~~ LD101: in the form of a rechargeable secondary cell, ~~or~~ electroplating
bath, or ~~electrolytical-electrolytic~~ processing electrode together with working
objects, or ~~still those~~ any other load necessitating the input of power of the
opposite polarity in the event of power interruption or of a reduction in power
20 supply ~~which is necessarily pulsating D.C. power source~~;
- ~~Conduction Contacts or Plug/Socket Assembly~~ conduction contacts or plug/socket
assembly P0: ~~being as such composed from of~~ electromechanical components;
and ~~being optional, optionally, with~~ having one terminal connected to the
charging power supply and relevant circuit on the power supply side, and the
25 other terminal for connected for coupling purpose ~~going purposes~~ to the load side.

What follows next is a description of the operation ~~rational~~ of the circuit
illustrated in Fig. 6;

When there is power available for output from the power supply PPS101, D.C.

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current will run to the load by way of the inductor L101 that is in parallel with the capacitor C101.

Once the power supply PPS101 voltage ~~turns~~ is turned down or becomes cut off, power of the opposite polarity ~~that is developed~~ in the inductor L101 that is in parallel
5 with the capacitor C101 will be delivered to the ~~Load~~ load by way of ~~Backflow Resistor~~ backflow resistor R500.

In summation, the ~~invention Circuit for the Generation of Electric Power Induced to Bear Opposite Polarity in the Pulsating D.C. Power Supply~~ opposite polarity power generating circuit of the invention features simplicity in structure, low ~~costs~~ cost, novelty
10 in design, precisely defined advantages, and for all these reasons is submitted to your highly esteemed authority for evaluation as to its patentability

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ABSTRACT

~~Circuit for the Generation of Electric Power induced to bear~~ A circuit for
generating electric power of opposite polarity in the a pulsating D.C. power supply
5 ~~whereby electric power of opposite polarity is generated at~~ the moment the D.C. pulsating
power ~~that is being delivered is suspended, by means of~~ includes an induction device in
series with or in parallel with the load, ~~and~~ for generating the power of opposite polarity
~~thus generated is fed and supplying it to the load, highlighted in substantial cut in~~
~~production cost with enhanced operational reliabilities.~~